

Multiple Choice Answers

Q13: B

Multiple Choice Answers

Q14: C

Multiple Choice Answers

Q13: D

Q15: C

3(a)	an arrow horizontally on the page to the left labelled F
	two arrows horizontally on the page to the right each labelled T
3(b)(i)	$T = 110 / 2$ $= 55 \text{ N}$
3(b)(ii)	$x = F / k$
	$= 110 / 250$
	$= 0.44 \text{ m}$
3(c)(i)	extension $= 55 / 250$ or $110 / (2 \times 250)$
	extension $= 0.22 \text{ m}$
3(c)(ii)	$E = \frac{1}{2} Fx$ or $E = \frac{1}{2} kx^2$ or $E = \frac{1}{2} F^2 / k$
	$E_1 / E_2 = (\frac{1}{2} \times 110 \times 0.44) / (2 \times (\frac{1}{2} \times 55 \times 10.22))$
	or
	$E_1 / E_2 = (\frac{1}{2} k \times 0.44^2) / (2 \times (\frac{1}{2} k \times 0.22^2))$
	or
	$E_1 / E_2 = (\frac{1}{2} \times 110^2 / k) / (2 \times (\frac{1}{2} \times 55^2 / k))$
	$E_1 / E_2 = 2.0$ (no ECF from 3(b)(ii) and 3(c)(i))

Multiple Choice Answers

Q15: B

Multiple Choice Answers

Q10: B

Q14: C

Multiple Choice Answers

Q11: D

Multiple Choice Answers

Q9: A

Q11: C

2(a)	in (rotational) equilibrium
	<u>sum / total</u> of CW moments about a point = <u>sum / total</u> of ACW moments about the (same) point.
2(b)(i)	The magnitudes of the moments about A are: (1700×3.0) ($660 x$) (1300×5)
	Correct magnitude of any one moment about A.
	Correct magnitudes of a second moment about A.
	(1700×3.0) + ($660 x$) = (1300×5) $x = 2.1 \text{ m}$
2(b)(ii)	(Upthrust =) $11 \times 9.81 + 1300 = 1400 \text{ (N)}$
2(b)(iii)	$y = \text{Upthrust} / \rho g A$
	$= 1400 / (990 \times 9.81 \times \pi \times (0.78 / 2)^2)$
	$= 0.30 \text{ m}$
	OR
	[$P = F / A = 1400 / \pi \times (0.78 / 2)^2 = 2930$] $y = P / \rho g$ $= 2930 / (990 \times 9.81)$
	$= 0.30 \text{ m}$
2(b)(iv)	line with a non-zero value of depth at distance = 0
	A line from distance = 0 to distance = 6.0 m with a gradient that is always positive